328. (new) The method of claim 312, wherein said photocatalytic surface layer consists essentially of said photocatalyst.

329. (new) The method of claim 321, wherein said film comprises silica.

REMARKS

The application has been amended to incorporate the limitation of dependent claim 302 into independent claim 301, and to incorporate the limitation of dependent claim 313 into independent claim 312. Also, each of claims 301 and 312 have been amended to delete the requirement of including silica or silicone in the photocatalytic layer. The remaining claims have been amended to eliminate dependencies on now-canceled claims 302 and 313.

Claims 303, 304, 314, 315 and 316 have been amended to add the article "said" before the term "photoexcitation". This responds to the Examiner's comments concerning the correct article to use before the term "photoexcitation" in the dependent claims.

New dependent claims 324-329 have been added.

A marked-up version of the amended claims is attached hereto.

A. Rejections Based in Section 112

The Examiner has rejected 301-323 as indefinite. With respect to independent claims 301 and 312, the Examiner stated that the term "the surface" in the preamble lacks proper antecedent basis. The applicants respectfully disagree that there is any indefiniteness in the use of the article "the" before "surface" in the preambles of these claims. However, the applicants have changed "the" to "a" to resolve the matter. The applicants believe that the article "a" in the phrase "providing a composite" is the proper article to use.

With respect to claims 303, 304, 314, 315 and 316, the Examiner objected to the absence of an article before "photoexcitation." The applicants respectfully disagree with this objection. However, the applicants have added the word "said" to resolve the matter.

B. Rejections Based on Field

The Examiner has rejected claims 301-306, 308-318 and 320-321 based on U.S. Patent No. 3,640,712 to Field et al. ("Field"). Field is directed to certain classes of hydrophobicity inducing agents useful in preparing a hydrophilic-hydrophobic photo-sensitive medium. (Field at col. 1, ll. 55-57.) The agents may be dispersed in a film-forming binder to form a film which may be either self-supporting or may be supported upon a suitable substrate. (*Id.* at ll. 64-66.) The purpose of the film is to act as a photo-sensitive medium for developing images. (*Id.* at ll. 59-61; *see also* col. 4, l. 64 - col. 5, l. 55.) The film of Field is an alternative to, for example, silver halide media useful in developing visible images. (*Id.* at ll. 10-20.)

Field is unconcerned with methods for reducing fogging, or methods of maintaining the surface of a composite in a clean state. There is no discussion of humidity in Field, nor is there any discussion of cleaning surfaces. Rather, Field is concerned with making prints such as lithographic prints, using a particular development system. Field is entirely unrelated to the present invention.

Field is classified in U.S class 430, concerning "radiation imagery chemistry; process, composition, or product thereof." The present application is classified in U.S. class 428, concerning "stock material or miscellaneous articles." Field is nonanalogus art with respect to the present invention, which is unrelated to radiation imagery.

"In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, reasonable pertinent to the particular problem with which the inventor was concerned." *In re Oeteker*, 977 F.2d 1443,

24 USPQ2d 1443, 1445 (Fed. Cir. 1992); *see also In re Deminski*, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986); *In re Clay*, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992); MPEP § 2141.01(a). Here, a person having ordinary skill in the art would not reasonably expect to solve the problem of preventing fogging on a substrate, or maintaining a clean surface, by considering a reference dealing with image chemistry. *See In re Clay*, 966 F.2d at 660, 23 USPQ2d at 1061 (finding reference dealing with plugging underground petroleum formation anomalies to be nonanalogous to problem of dead volume in tanks for storing refined petroleum). As such, Field is not prior art.

Even if Field were prior art, it would not render the pending claims obvious. Field does not disclose any methods of preventing or reducing fogging, and Field does not disclose subjecting any surfaces to humidity. Likewise, Field does not disclose any methods of cleaning a surface, or keeping a surface free of deposits and contaminants in air and environmental precipitation. Such claim elements are not present in Field. Accordingly, Field cannot be deemed to anticipate or render obvious any claims in the present application.

C. Rejections Based on Heller

The Examiner has rejected claims 301, 305-307, 309, 312, 317-319 and 322 based on U.S. Patent No. 5,616,532 to Heller et al. ("Heller"). Heller is directed to certain photocatalyst-binder compositions. Heller does not disclose rendering surfaces hydrophilic, and, *a fortiori*, does not disclose rendering surfaces hydrophilic to particular levels of hydrophilicity. Further, Heller does not discuss fogging or methods of preventing or reducing fogging.

Independent claims 301 and 312, as amended, require hydrophilicity (after photoexcitation) to the degree that the contact angle with water is less than 10° (claim 301) or 20° (claim 312). Thus, these claims incorporate the limitations of now-canceled claims 302 and 313, respectively. Those now-canceled claims were not rejected on the basis of Heller; thus, the

Examiner has recognized that these limitations distinguish the present invention over Heller. Accordingly, the rejection based on Heller shall be withdrawn, and the pending claims should be allowed.

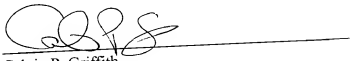
D. Rejections Based on Murasawa

The Examiner has rejected claims 301, 305-307, 309, 312, 317-319 based on U.S. Patent No. 5,547,823 to Murasawa et al. ("Murasawa"). Murasawa relates to a photocatalyst composite and process for producing the same. The composite may be used for decomposition of deleterious materials, malodorous materials, and oily substances in waste products. It does not disclose or discuss methods of preventing fogging of surfaces, or cleaning them, nor does it discuss hydrophilicity or degrees thereof.

Independent claims 301 and 312, as amended, require hydrophilicity (after photoexcitation) to the degree that the contact angle with water is less than 10° (claim 301) or 20° (claim 312). Thus, these claims incorporate the limitations of now-canceled claims 302 and 313, respectively. Those now-canceled claims were not rejected on the basis of Murasawa; thus, the Examiner has recognized that these limitations distinguish the present invention over Murasawa. Accordingly, the rejection based on Murasawa should be withdrawn, and the pending claims should be allowed.

In view of the foregoing, the Applicants respectfully request favorable consideration and allowance of all pending claims.

Respectfully submitted,



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Date: February 25, 2002

APPENDIX

301. (amended) A method of preventing or reducing fogging of [the] a surface of a composite when subjected to humid conditions, comprising:

providing a composite with a surface, said composite comprising a substrate and a photocatalytic surface layer, said photocatalytic surface layer comprising [(1)] a photocatalyst [and (2) silica or silicone];

subjecting the photocatalyst to photoexcitation to render the surface of the composite hydrophilic, wherein, after said photoexcitation, the surface of the composite has a water wettability of less than 10° in terms of the contact angle with water; and

subjecting the composite to humidity.

303. (amended) The method of claim 301, wherein, after said photoexcitation, the surface of the composite has a water wettability of less than 5° in terms of the contact angle with water.

304. (amended) The method of claim 301, wherein, after said photoexcitation, the surface of the composite has a water wettability of about 0° in terms of the contact angle with water.

305. (amended) The method of [claims] claim 301 [or 302], wherein said photocatalyst is selected from the group consisting of TiO_2, ZnO, SnO_2, Sr TiO_3, WO_3, Bi_2O_3 and Fe_2O_3.

308. (amended) The method of [claims] claim 301 [or 302], wherein said composite further comprises a protective coating over the photocatalytic surface layer.

309. (amended) The method of [claims] claim 301 [or 302], wherein said substrate comprises glass.

310. (amended) The method of [claims] claim 301 [or 302], wherein, said substrate comprises glass containing alkaline network modifier ions, and wherein said composite further comprises a film disposed between said substrate and said photocatalytic surface layer, said film preventing ions from diffusing from said substrate into said photocatalytic surface layer.

312. (amended) A method for maintaining a surface of a composite in a clean state when subjected to deposits and contaminants in air and environmental precipitation, comprising:

providing a composite with a surface, said composite comprising a substrate and a photocatalytic surface layer, said photocatalytic surface layer comprising [(1)] a photocatalyst [and (2) silica or a silicone];

subjecting the photocatalyst to photoexcitation to render the surface of the composite hydrophilic, wherein, after said photoexcitation, the surface of the composite has a water wettability of less than about 20° in terms of the contact angle with water; and

contacting the surface of the composite with water.

314. (amended) The method of claim 312, wherein, after said photoexcitation, the surface of the composite has a water wettability of less than 10° in terms of the contact angle with water.

315. (amended) The method of claim 312, wherein, after said photoexcitation, the surface of the composite has a water wettability of less than 5° in terms of the contact angle with water.

316. (amended) The method of claim 312, wherein, after said photoexcitation, the surface of the composite has a water wettability of about 0° in terms of the contact angle with water.

317. (amended) The method of [claims] claim 312 [or 313], wherein said photocatalyst is selected from the group consisting of TiO_2, ZnO, SnO_2, Sr TiO_3, WO_3, Bi_2O_3 and Fe_2O_3.

320. (amended) The method of [claims] claim 312 [or 313], wherein said composite further comprises a protective coating over the photocatalytic surface layer.

321. (amended) The method of [claims] claim 312 [or 313], wherein said substrate comprises glass containing alkaline network modifier ions, and wherein said composite further comprises a film disposed between said substrate and said photocatalytic surface layer, said film preventing ions from diffusing from said substrate and photocatalytic surface layer.

322. (amended) The method of [claims] claim 312 [or 313], wherein said substrate is a tile, a portion of the body of a motor vehicle, an inner panel of a building, or an outer panel of a building.